

**Abstract of the Disclosure**

An example system and method for processing image data of a plurality of time-separated images of a non-rigid body to detect movement of the body involves calculating and storing, for each of a plurality of sampling points in each image, a plurality of candidate movements together with the estimated probability of each candidate. For each sampling point, the probability of each of the candidate movements is recalculated based on the stored probability of that candidate movement and the probabilities of the candidate movements at neighboring sampling points. A motion field indicative of the non-rigid body movement is generated from the recalculated probabilities.